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DEVICE FOR VENDING CYLINDRICAL OBJECTS

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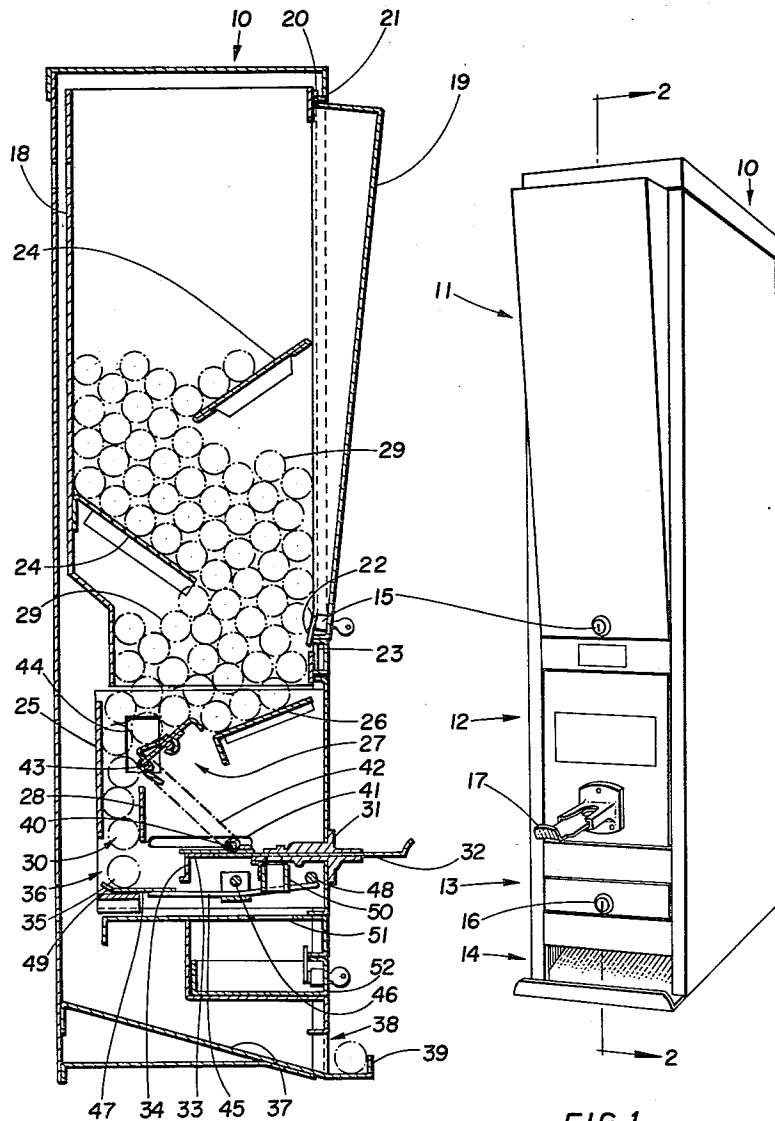


FIG. 1

FIG. 2

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3,095,997 DEVICE FOR VENDING CYLINDRICAL OBJECTS

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This invention relates to package vending devices and particularly to vending devices adapted to selectively dis-
pense cylindrical objects having a uniform size.

In the dispensing of cylindrical objects from vending machines, the problem of providing a smooth feed without jamming is not solved by the use of a simple gravity feed alone. Space requirements for the vending machine re-
quire the use of a substantially vertical hopper within which the objects due to confined storage tend to jam across a narrow portion of the hopper.

It is the main object of this invention to provide a vending device which is adapted to store a quantity of cylindrical objects and to selectively dispense the objects upon the manual operation of a control lever.

It is a further object of this invention to provide a vending device having an article storage hopper which by compartmentation will prevent the articles contained there-
in from becoming jammed in any portion of the storage or dispensing system.

It is a further object of this invention to provide a vending machine which being operable by the insertion of a coin therein will automatically refuse the coin upon the storage hopper being empty.

It is a further object of this invention to provide a vending machine which incorporates an automatically operated sifting mechanism in the dispensing throat of the device in order to prevent jamming of the vended articles therein.

These and other objects and features of this invention will become apparent when taken in conjunction with the following specification and accompanying drawings.

In the drawings:

FIGURE 1 is a perspective view of the vending device showing the exterior features thereof; and,

FIGURE 2 is a mid-vertical section through the vending device taken along the line 2-2 in FIGURE 1.

Referring to FIGURE 1, the vending device comprises exterior case 10 having a substantially rectangular configuration adapted to encompass a hopper shown generally at 11 in the upper portion, a dispensing mechanism shown generally at 12 below hopper 11, a coin collector box shown generally at 13 positioned below dispensing mechanism 12, and an article dispensing chute shown generally at 14 located below collector box 13 in the lowest portion of exterior case 10. Hopper 11 and collector box 13 are provided with tumbler locks 15 and 16 respectively whereby a tamper-proof access is provided to hopper 11 in order to replenish the supply of vended articles and to remove collected coins stored within collector box 13.

A conventional push-pull coin slide 17 is provided mounted on the exterior face of dispensing mechanism 12 for the purpose of receiving coins and operating the internal mechanism.

Referring to FIGURE 2, the internal detail comprises a hopper case 18 having a substantially rectangular cross-section being rigidly secured within exterior case 10. The hopper door 19 providing the exterior portion of hopper 11 is shown in the normally closed position being held by an upper lip 20 of the door 19 impinging on frame 21 of exterior case 10, and being held at the lower end by arm 22, connected to the lock 15, impinging upon

lower frame 23 of exterior case 10. The plurality of baffles 24 rigidly secured to the side of hopper case 18 extend from the front and from the back of hopper case 18 sloping downwardly and inwardly substantially toward the centre of hopper case 18 in an alternate manner.

The dispensing mechanism 12 located immediately sub-
jacent to hopper case 18 comprises the mechanism case 25 having a substantially open configuration being rigidly secured within exterior case 10 and adapted to support the operating elements of dispensing mechanism 12. A downwardly converging chute is formed within mechanism case 25 by upper baffle plate 26, agitating rocker assembly shown generally at 27, and lower baffle plate 28 whereby articles 29 stored within hopper case 18 and the upper portion of mechanism case 25 are reduced to a single vertical stack shown generally at 30 substantially towards the rear of mechanism case 25.

Coin slide 17 secured to the lower front portion of mechanism case 25 comprises an immovable body portion 31 and a movable slide 32. The inner end of slide 32 terminates in rigid attachment with projector plate 33 having a downwardly formed lip 34. Upon the manual movement of slide 32 inwardly lip 34 dislodges the lower-
most article 35 from stack 30 and out an opening shown generally at 36 in mechanism case 25 whereupon article 35 drops into the space provided between mechanism case 25 and exterior case 10 to fall upon a downwardly and forwardly sloping tray 37 from whence it is deposited through an opening 38 in the lower portion of exterior case 10 into dispensing tray 39.

A horizontally disposed pin 40 rigidly secured to projector plate 33 projects through the horizontal slot 41 in the side wall of mechanism case 25 to terminate in rotatable attachment with a link 42. Locker assembly 27 pivotally mounted to mechanism case 25 about a mid-point has a lower extremity thereof rigidly secured to a pin 43 which projects through a slot 44 formed in the side wall of mechanism case 25. Pin 43 is rotatably secured to the upper end of link 42 whereby manual movement of slide 32 will through link 42 cause a rock-
ing motion of rocker assembly 27 thus agitating articles 29 within the lower portion of hopper 11 thereby preventing a jamming of articles 29 in the converging portion of mechanism case 25.

The upper face of rocker assembly 27 being concave imparts a rolling motion to articles 29 resting thereon whereby horizontal as well as vertical movement is im-
parted to articles 29 thus eliminating any tendency to jam due to gravity feed alone.

A coin refusal mechanism located below coin slide 17 comprises a balance arm 45 pivotally secured to the side walls of mechanism case 25 by pin 46 substantially at the mid-point thereof. A pressure plate 47 located immediately below stack 30 is rigidly secured to one end of balance arm 45 whereby pressure of articles 29 upon pres-
sure plate 47 will hold the coin refusal mechanism in an inoperative position. Upon hopper 11 and dispensing mechanism 12 being empty of articles 29 a counter-balance weight 48 rigidly secured to the distal end of balance arm 45 will by gravimetric pull cause pressure plate 47 to move upwardly to impinge upon lip 34 of projector plate 33 to prevent the inward movement of slide 32 thus re-
fusing an offered coin.

Lip 49 formed upwardly along the rear edge of pres-
sure plate 47 retains lowermost article 35 from being ac-
cidentally dislodged and thus dispensed, the pressure of lip 34 on projector plate 33 however being sufficient to over-
come the slight resistance offered by lip 49 upon normal dispensing being desired.

A vertically positioned tube 50 arrests the horizontal movement of coins passing through coin slide 17 there-
by allowing coins to drop through a hole 51 in the bottom

of mechanism case 25 into collector box 13. A removable tray 52 in collector box 15 is locked in the normally closed position by means of lock 16.

Having particular regard to the foregoing, it will be appreciated that the vending device comprises an upper storage hopper provided with baffling means whereby horizontal as well as vertical storage of essentially cylindrical articles may be contained which terminates at the lower portion thereof in a single vertical stack of articles which are adapted to be dispensed in single fashion by manual operation of a coin slide.

A rocker assembly in communication with the coin slide by linkage means imparts a forced horizontal motion to the articles thereby preventing jamming due to a vertical gravity feed.

A gravity operated coin refusal device is incorporated within the dispensing mechanism whereby coins are refused upon the dispenser being empty of contents. In addition, tamper-proof closures are provided for the replenishing of vended articles and for the collection of coins.

What I claim is:

1. A device for vending cylindrical articles comprising: a hopper of substantially rectangular cross-section having sides spaced apart a distance substantially equal to the length of said articles and front and back wall portions spaced apart a distance greater than the diameter of said articles and defining the width of said hopper; at least one baffle in said hopper extending from one of said wall portions in a downwardly sloping manner substantially toward the middle of said hopper; a channel located adjacent to said hopper converging from a width substantially equal to said hopper to a width substantially equal to the diameter of said articles forming said articles therein into a stack; an agitator incorporated in said channel and pivotally mounted for see-saw movement relative thereto; an operable coin slide in communication with said agitator; linkage means pivotally connected to said coin slide and to said agitator and transmitting motion of said coin slide in one direction to said agitator to displace the same and transmitting motion of said coin slide in the reverse direction to said agitator to return the same, said movement of said agitator procuring simultaneous movement of said articles in said hopper; an article delivery member attached to said coin slide for movement together therewith and oriented in alignment with the lowermost article in said stack to move the same therefrom simultaneously with movement of said coin slide in said one direction; and a dispensing chute located subjacent to said channel.

2. A device for vending cylindrical articles comprising: a hopper of substantially rectangular cross-section having sides spaced apart a distance substantially equal to the length of said articles and front and back wall portions spaced apart a distance greater than the diameter of said articles and defining the width of said hopper; at least one baffle in said hopper extending from one of said wall portions in a downwardly sloping manner substantially toward the middle of said hopper; a channel located adjacent to said hopper converging from a width substantially equal to said hopper to a width substantially equal to the diameter of said articles forming said articles therein into a stack; an agitator incorporated in said channel and pivotally mounted for see-saw movement relative thereto; an operable coin slide in communication with said agitator; linkage means pivotally connected to said coin slide and to said agitator and transmitting motion of said coin slide in one direction to said agitator to displace the same and transmitting motion of said coin slide in the reverse direction to said agitator to return the same, said movement of said agitator procuring simultaneous movement of said articles in said hopper; an article delivery member attached to said coin slide for movement together therewith and oriented in alignment with the lowermost article in said stack to move the same

therefrom simultaneously with movement of said coin slide in said one direction; and a dispensing chute located subjacent to said channel.

3. A device for vending cylindrical articles comprising: a hopper of substantially rectangular cross-section having sides spaced apart a distance substantially equal to the length of the longest of said articles and front and back wall portions spaced apart a distance greater than the diameter of said articles and defining the width of said hopper; at least one baffle in said hopper extending from one of said wall portions in a downwardly sloping manner substantially toward the middle of said hopper; a channel located subjacent to said hopper converging from a width substantially equal to said hopper to a width substantially equal to the diameter of said articles forming said articles therein into a stack; an agitator incorporated in said channel comprising a pivotally supported plate member having a concave upper surface oriented to contact at least some of said articles therein; an operable coin slide in communication with said agitator; linkage means pivotally connected to said coin slide and to said agitator and transmitting motion of said coin slide in one direction to said agitator to partially rotate the same in one direction and transmitting motion of said coin slide in the other direction to said agitator to partially rotate the same in the reverse direction, said rotation of said agitator procuring simultaneous movement of said articles in said hopper; an article delivery member attached to said coin slide for movement together therewith and oriented in alignment with the lowermost article in said stack to move the same therefrom simultaneously with movement of said coin slide in said one direction; and a dispensing chute located subjacent to said channel.

4. A device for vending cylindrical articles comprising: a hopper of substantially rectangular cross-section having sides spaced apart a distance substantially equal to the length of the longest of said articles and front and back wall portions spaced apart a distance greater than the diameter of said articles and defining the width of said hopper; at least one baffle in said hopper extending from one of said wall portions in a downwardly sloping manner substantially toward the middle of said hopper; a channel located adjacent to said hopper converging from a width substantially equal to said hopper to a width substantially equal to the diameter of said articles forming said articles therein into a stack; an agitator incorporated in said channel comprising a pivotally supported plate member having a concave upper surface oriented to contact at least some of said articles therein whereby pivotal movement of said agitator will impart a rolling movement to some of said articles; an operable coin slide in communication with said agitator; linkage means pivotally connected to said coin slide and to said agitator and transmitting motion of said coin slide in one direction to said agitator to partially rotate the same in one direction and transmitting motion of said coin slide in the other direction to said agitator to partially rotate the same in the reverse direction, said rotation of said agitator procuring simultaneous movement of said articles in said hopper; an article delivery member attached to said coin slide for movement together therewith and oriented in alignment with the lowermost article in said stack to move the same therefrom simultaneously with movement of said coin slide in said one direction and a dispensing chute located subjacent to said channel.

5. A device for vending cylindrical articles comprising: a hopper of substantially rectangular cross-section having sides spaced apart a distance substantially equal to the length of the longest of said articles and front and back wall portions spaced apart a distance greater than the diameter of said articles and defining the width of said hopper; the shortest of said articles having a length greater than fifty percent of the length of the longest of said articles; at least one baffle in said hopper extending

from one of said wall portions in a downwardly sloping manner substantially toward the middle of said hopper; a channel located subjacent to said hopper converging from a width substantially equal to said hopper to a width substantially equal to the diameter of said articles forming said articles therein into a stack; an agitator incorporated in said channel comprising a pivotally supported plate member having a concave upper surface oriented to contact at least some of said articles therein; an operable coin slide in communication with said agitator; linkage means pivotally connected to said coin slide and to said agitator and transmitting motion of said coin slide in one direction to said agitator to partially rotate the same in one direction and transmitting motion of said coin slide in the other direction to said agitator to partially rotate the same in the reverse direction, said rotation of said agitator procuring simultaneous movement of said articles in said hopper; an article delivery member attached to said coin slide for movement together therewith and oriented in alignment with the lowermost article in said stack to move the same therefrom simultaneously with movement of said coin slide in said one direction; and a dispensing chute located subjacent to said channel.

6. A device for vending cylindrical articles comprising: a hopper of substantially rectangular cross-section having sides spaced apart a distance substantially equal to the length of the longest of said articles and front and back wall portions spaced apart a distance greater than the diameter of said articles and defining the width of said hopper; the shortest of said articles having a length greater than fifty percent of the length of the longest of said articles; at least one baffle in said hopper extending from one of said wall portions in a downwardly sloping manner substantially toward the middle of said hopper; a channel located subjacent to said hopper converging from a width substantially equal to said hopper to a width substantially equal to the diameter of said articles forming said articles therein into a stack; an agitator incorporated in said channel comprising a pivotally supported plate member having a concave upper surface oriented to contact at least some of said articles therein; an operable coin slide in communication with said agitator; linkage means pivotally connected to said coin slide and to said agitator and transmitting motion of said coin slide in one direction to said agitator to partially rotate the same in one direction and transmitting motion of said coin slide in the other direction to said agitator to partially rotate the same in the reverse direction, said rotation of said agitator procuring simultaneous movement of said articles in said hopper; an article delivery member attached to said coin slide for movement together therewith and oriented in alignment with the lowermost article in said stack to move the same therefrom simultaneously with movement of said coin slide in said one direction; a gravity operated coin slide lock held inoperative by pressure of said articles within said channel; and a dispensing chute located subjacent to said channel.

7. A device for vending cylindrical articles comprising a hopper of substantially rectangular cross-section having

sides spaced apart a distance substantially equal to the length of said articles and front and back wall portions spaced apart a distance greater than the diameter of said articles and defining the width of said hopper; at least one baffle in said hopper extending from one of said wall portions in a downwardly sloping manner substantially toward the middle of said hopper; a channel located subjacent to said hopper converging from a width substantially equal to said hopper to a width substantially equal to the diameter of said articles forming said articles therein into a stack; an agitator plate member incorporated in said channel pivotally mounted for rocking movement about a central axis, said agitator having an upper face on each side of said axis and, contacting at least some of said articles on each said side to impart a rocking motion thereto; a coin slide operable from the exterior of said device on a linear path; linkage means connected to said coin slide and to said agitator remote from said axis and transmitting linear movement of said coin slide to said agitator as a rocking movement thereof about its said axis; an article delivery member attached to said coin slide and moving together therewith to move a said article in a direction substantially normal to the axis of said channel; and a dispensing chute located subjacent to said channel.

8. A device for vending cylindrical articles comprising: a hopper of substantially rectangular cross-section having sides spaced apart a distance substantially equal to the length of the longest of said articles and front and back wall portions spaced apart a distance greater than the diameter of said articles and defining the width of said hopper; at least one baffle in said hopper extending from one of said wall portions in a downwardly sloping manner substantially toward the middle of said hopper; a channel located subjacent to said hopper converging from a width substantially equal to said hopper to a width substantially equal to the diameter of said articles forming said articles therein into a stack; an agitator plate member pivotally mounted adjacent said channel for rocking movement about a central axis thereof and having plate portions extending from either side of said axis, said agitator having a concave upper surface for contacting at least some of said articles on each side of said axis; a coin slide operable from the exterior of said device on a linear path; a linkage bar having one end pivotally fastened to said coin slide and the other end pivotally fastened to one of said agitator plate portions remote from said axis and transmitting linear movement of said coin slide to said agitator plate member as a rocking movement thereof about said axis; an article delivery member attached to said coin slide and moving together therewith to move a said article in a direction substantially normal to the axis of said channel; and a dispensing chute located subjacent to said channel.

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